

The Royal Australian College of General Practitioners

# COMPUTER ASSISTED PRACTICE PROJECT 1986 -1993

Report Summary
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### **Acknowledgments**

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**The members of the CAPP evaluation team were: Dr. Peter MacIsaac, Miss Joan Caelli, Dr. Trevor Lord, Dr. Michael Crampton, Dr. Michael Kidd, Mr. Stephen Farish.**

**Dr. John North was the Chairman of the CAPP Co-ordinating Committee of the RACGP.**

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## **Chapter 1    SUMMARY**

Between 1986 and 1989 computerised patient records were installed in 42 Australian general practices. This project was jointly sponsored by the Royal Australian College of General Practitioners and Medrecord (the vendor of the computer system). Throughout the 1980s computer systems had become widely used in general practice for accounting and practice management, however few practices were using computers for clinical applications. The purpose of this project was to generate demonstration sites and to study the implementation of a computerised records system.

Those involved in the evaluation and co-ordination of the CAP project since its inception in 1985 have been provided with an opportunity to observe both the implementation of a clinical records system and the process of conducting a large information technology project in General Practice. The following are presented as a summary of the major findings of this project.

**Where practices have chosen to implement computer assisted patient records there has been a high level of acceptance by doctors, practice staff and patients.**

**The benefits of computer assisted records relate to an improved access to information at both the patient and practice level.**

**The major problems reported concern the cost of computer systems and increased consultation time in some practices. We will better understand the factors influencing medical record use with further research into doctor's use and attitudes towards the existing paper records systems.**

**Data is the most valuable component of the computer system. It must be protected by adequate backup routines.**

**The most successful practices rapidly implemented computerised clinical records. In this project we did not see any generalised use of the stepwise or "modular" implementation of clinical functions.**

**The experience and opinions of successful users of computerised records are a valuable resource. Experienced users have the vision and expertise to assist with the development of excellent clinical records systems**

**The CAPP data base could prove to be a relatively easily accessible source of data for research on the nature of Australian general practice.**

**The practices able to produce reports from their data demonstrated the potential of access to aggregated practice data. Medical records systems must contain a "user-friendly" report generator. Further development of coding system use in Australia is essential.**

**The existing Medrecord system is unlikely to be further developed, leaving many practices in an uncertain position regarding their clinical records. The issue of medical record data portability across computer systems deserves urgent consideration by medical professional bodies such as the RACGP, and Australian Medical Association, the computer industry and government.**

**Information technology projects are inherently complex and should:**

- **have clearly focused, limited objectives and where possible involve more than one approach to avoid the pitfalls of failed implementation..**
- **be implemented in practices which have already installed a computerised practice management system.**
- **have regular monitoring of progress by an external auditor/evaluator to assist the management committee and funding body.**

**Australian GPs must have access to high quality, functional clinical software before any other issue relating to the introduction of information technology can be addressed.**

## **1.1 Study Design**

The Computer Assisted Practice Project (CAPP) is a study of the implementation of a computerised records system in a selected group of Australian general practices from 1986 to 1993.

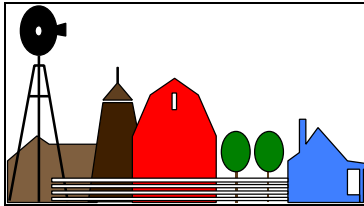
Practices were selected on the basis of their motivation and perceived likelihood of making a successful conversion to computerised records. To be selected practices were required to make a considerable financial commitment by paying for half the costs of the computer system.

The first group of 23 practices participated in a detailed implementation study consisting of data collected from personal contacts, practice visits, questionnaires, and documentation of the organising committee. This stage of the project was known as the Computer Assisted Practice Project - Stage 1 (CAPP1). A report on the first two year of the project was produced in 1990.

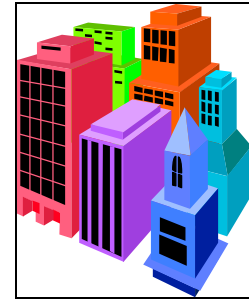
In 1989 a further 19 practices were recruited into the project (CAPP2). Both groups were surveyed in January 1993 by questionnaires and phone interviews.. This report integrates the data and findings of the first stage (CAPP1 1986-1988) with the data obtained in a second study. This study was supported by a Demonstration Practice Grant from the Commonwealth Department of Human Services and Health (January 1993).

## **1.2 Practice Characteristics**

The practices selected represented varying practice sizes, and location to include both urban and rural settings.

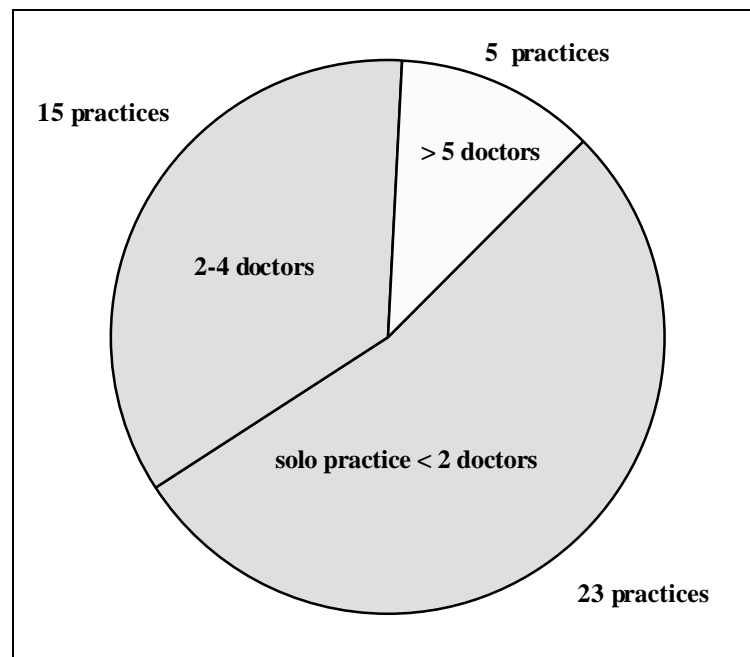


19 Rural Practices



23 Metropolitan practices

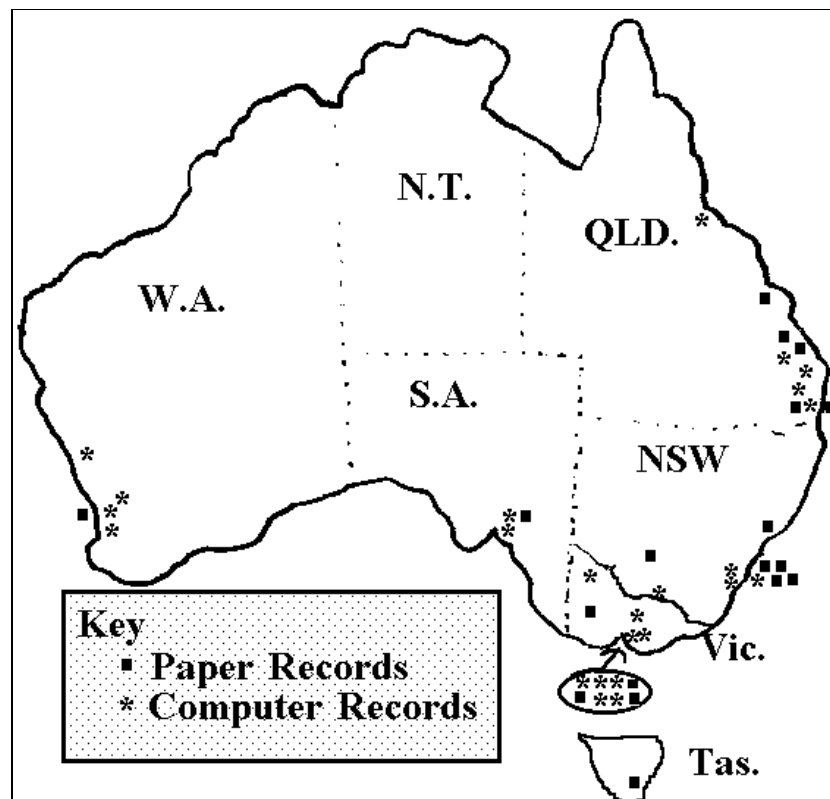
Prior to the project most practices or doctors had limited previous computing experience. All practices operated on a "Fee for service" basis, which represents the vast majority of Australian general practices. Community health centres, hospital, or large "entrepreneurial" clinics were not represented in this project. The majority of practices were teaching practices (undergraduate and post-graduate) and all contained members of the Royal Australian College of General Practitioners.



Practice Size - CAPP1 & 2

Practices were selected from all states (excepting Northern Territory).

The following map shows the location of the CAPP practices and indicates the type of records in use as of January 1993.



Location of Practices

### 1.3 Installation and training

Changing from a paper based records system to a computerised system and the significant change in a doctor's consulting processes are the major issues affecting the introduction of a computerised records system

The CAP project reflected numerous approaches to the issue of how to start using the computerised records system. Practices should consider this issue at the planning stage and to develop achievable goals and solutions.

**Introduction of a computer has a significant effect on the consulting process.**

The following approach to installation and training best represents the CAPP experience:

**1. Before-Installation**

Adequate consultation and discussion with all staff involved in computer use is essential. Doctors and staff should learn to type and develop basic familiarity with personal computer systems.

**2. Installation**

Install the computer and commence with accounting functions. This will develop familiarity with the system and procedures. Additional staff time and resources need to be available during the installation period. At this stage each practice needs to develop a plan outlining how the records will be implemented. An effort should be made to thoroughly train one or two staff and doctors who can then act as a resource for the rest of the practice.

**3. Data Entry**

Primary data entry method will be by the doctor when patients present for consultation. Most doctors will prefer initially to enter the records between consultations. Keep the original paper record for reference. Do not attempt to copy all previous records - copy across summary and important data. Until electronic transfer of pathology and xray reports becomes generally available either a copy or summary of these reports is entered by practice staff after the doctor has checked and "highlighted" the relevant sections.

**4. Indicate which records have been fully transferred.**

Until the doctor is satisfied that the paper record is no longer required, the old record must be available during the consultation. When the record is no longer required signify on both the paper record and computerised notes that data transfer has been completed.

**5. Regular review or audit**

Uptake of medical records functions should be monitored to provide encouragement and peer review for the medical staff.

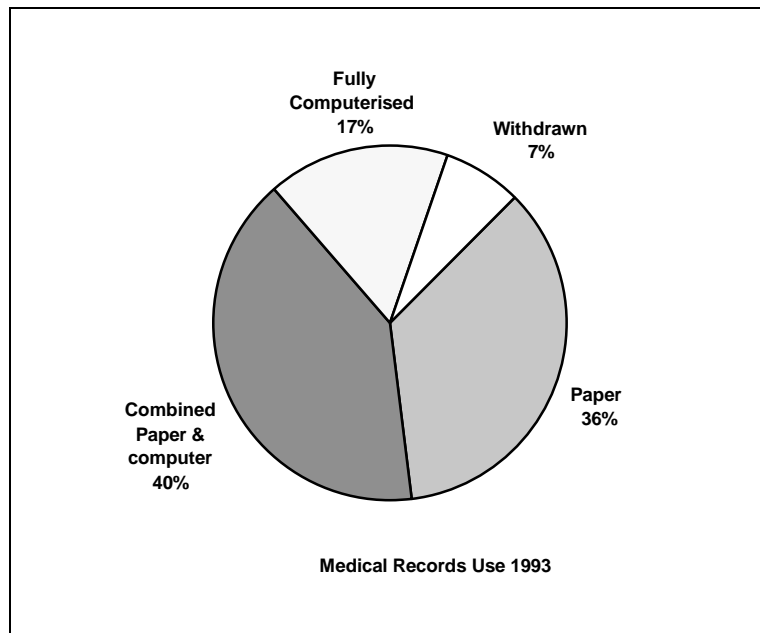
**6. Acceptance of dissent**

It is likely that, in all but solo practices, there will be some doctors who do not wish to be involved with a computerised clinical system. The CAPP practices seemed to be able to tolerate the co-existence of manual and computerised records. "Conversion" by the passage of time and example should be considered.

## **1.4 Computer System Use**

In January 1993 24 of the 42 practices (57%) claimed to be using some elements of their clinical records system with 6 practices indicating that they were fully computerised. The following figure presents the levels of computer use.





The majority of practices who commenced using the computer in the early CAP project tended to maintain their level of computerisation in spite of a lack of development in the computer software.

Practices using both paper and computerised records (combined practices) used the computer for x-ray and pathology result storage, preventive prompting and the medication record. Practice staff generally used the clinical system for entry of investigation results and reports and patient recall.

Doctor usage of the computerised patient record varied in group practices. Many practices had some doctors not using the system. This did not cause major difficulties. Locum doctors did have difficulties with computer assisted records, however the extra time often available to a locum was seen as a compensating factor.

Eighteen of the 42 practices are not using any elements of the clinical system although most are using the Medrecord accounting system. While the reasons for this are undoubtedly complex, the most often stated reasons relate to lack of time and enthusiasm. Unless otherwise stated the remainder of this study concerns only those practices using the computer for clinical applications.

## 1.5 Data Entry

The three commonly used data entry methods were:

- doctor entry by keyboard after the consultation
- doctor entry by keyboard during the consultation
- marking relevant report passages for later entry by practice staff

Doctors rated the ability to type as being important and in the consulting room most doctors positioned their computer screen so that it was accessible to the patient. A few practices routinely used hand written encounter sheets for later typist entry.

Few practices were able to use their patient data for research or practice audit. Those that did, however were able to obtain a rapid and inexpensive answer to many questions about their administration and clinical records.

While the overall uptake of clinical records was less than hoped for at the outset, there are a substantial body of doctors who have used their systems to the maximum. Within these practices there are many doctor/years of computerised notes. These practices could provide a resource of reasonably accessible medical records for research in general practice.

**Overall practices who have been more successful in implementation of clinical records are characterised by:**

- **early use of all aspects of the records system**
- **involvement of all or the majority of doctors in computerised record keeping.**

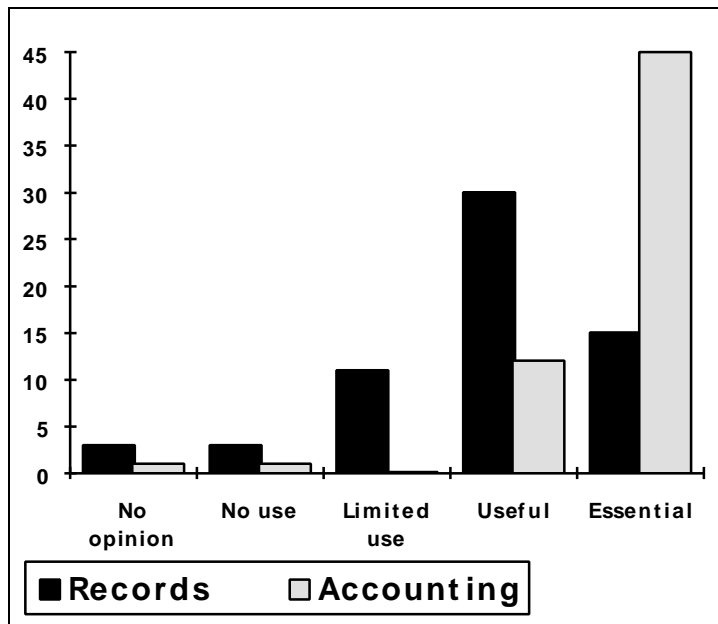
## **1.6 Benefits of Computerised Medical Records**

A number of the practices have reached the stage where their systems have replaced and improved upon the pre-existing manual system. These practices are now able to explore applications which would not have been possible with a manual record system.

Overall 72 % of doctors reported that their records system was either useful or essential. The majority of doctors report both increased efficiency and increased enjoyment of their work as an effect of using the computer.

### **Major Benefits of Computerised Records**

- Improved access to information
- Legibility and order
- Drug information and computerised prescribing
- Improved preventive care
- Audit and practice research
- Doctor and Staff satisfaction



Doctor's opinions of the clinical and accounting system.

The major benefits reported involved improved access to information through:

- faster access to records
- improved access to sections of the record such as pathology results
- access to records at times not usually available such as during phone calls
- reduction in lost or misplaced files
- legible and ordered records and improved records summary

Some practices reported an improved access to information on drugs and drug interactions, and a reduction in writing due to automated referrals and prescriptions. The introduction of computerised accounting has clearly improved practice management.

The use of a computerised opportunistic recall system has been demonstrated to be effective in increasing preventive activities such as cervical cancer screening and adult tetanus immunisation. Computer assisted prescribing lead to a decrease in prescribing errors and was followed by the removal of legal blocks to the printing of prescriptions.

The potential uses of practice data in audit and research have been clearly demonstrated. There is over 100 doctor/years of complete computerised medical records accessible in the 14 higher use practices. This data if aggregated (with due respect for patient and doctor confidentiality) could provide a source of information about the nature of "everyday" general practice in Australia.

Introduction of the computer has provided benefits in the areas of practice management, patient care and doctor and staff satisfaction. This has occurred despite the developmental nature of the software, the lengthy learning and adjustment period for computerisation of records, and the failure of the software to be developed after the initial two years.

## 1.7 Problems and Difficulties

CAP practices have received few enhancements to the Medrecord system since 1988. Despite this lack of progress 75% of practices were satisfied with the level of support provided by Medrecord.

Practices using the clinical records system were asked to comment on problems and difficulties encountered. Few problems have been reported which relate to the introduction of a computerised records and accounting system. The major problem area has been the capital and ongoing operating costs of the computerised records system. There is no data comparing costs of a computerised records system to a paper based records systems. No practice reported major difficulties with staff co-operation, confidentiality of records or patient acceptance.

Accessible support, rapid resolution of problems and minimal "down time" are essential if doctors are to rely on computerised medical records,

Both doctors and staff indicate that practice operation is severely disrupted when the system is not operating ("down").

Doctors were divided in their response to suggested problem areas Half the doctors felt that their consultation time was increased. There is a perceived increase in patient satisfaction. The use of computerised records did not seem to place a communication barrier between doctor and patient.

Data is the most valuable component of the computer system. It must be protected by adequate backup routines.

The data (information) in the computerised record is clearly the most valuable part of the system. This data is at risk of damage or loss hence the desirability of having a secure system for backing up or making a copy of this information. The backup system was improved after the five episodes of data loss occurring during the first two years of computer operation. Data loss in the remaining four years was minimal. Deficiencies in the backup system were detected in 10 practices. These usually related to using less than the acceptable number of backup tapes/disk sets.

The CAPP experience supports the need for a backup routine, an adequate number of backup copies/sets and procedures to check backup tapes/disks to ensure that they are operational. Both practices and computer professionals need to be wary of communication problems and misinterpretation of instructions during telephone support.

#### Problem Areas:

- cost
- disruption when system "down"
- potential for loss of data

Summary of problem areas

## **1.8 Patient Response**

Overall there is a high degree of patient satisfaction with computerised medical records. Only 3 percent of patients reporting unhappiness about their doctor using computerised records. The small group of unhappy patients tended also to feel uncomfortable in computer assisted consultations, felt the computer interfered with doctor listening and were concerned about privacy issues.

The major area of concern seems to be related to the consultation process. 19% of patients reported some degree of discomfort during computerised consultations. 9% reported that they always feel uncomfortable. 23% reported that they felt the computer interfered with the doctor-patient communication.

We have no comparative data for patient comfort and doctor's listening ability when doctors keep paper records.

With regard to confidentiality of records, 3% of patients expressed serious concern and a further 17 % expressed "a little" concern. Older patients tended to have less concern than younger patients. The perceptions of doctors tended to mirror the patient response. Three of the 53 doctors responding reported concerns about patient satisfaction. 11 doctors reported that the computer can be a barrier to communication. There were no reports of significant breaches of system security or patient confidentiality.

## **1.9 Conclusions**

The use of computers for clinical applications such as medical records and recall have achieved a high level of acceptance by doctors, practice staff and patients.

The Computer Assisted Practice Project has demonstrated that highly motivated practices have been able to use one medical records system either as the sole record or in conjunction with a paper records system. Other practices showed that they were unable to use this system reflecting over-optimistic expectations and the inability to overcome the practical problems of changing their records system.

The benefits of computerised records seem to relate to an improved access to information about the individual patient and the practice. The problems relate to the cost of computer systems and the time taken to use computerised records in some practices.

One participant commented that medical records are kept "at a cost to the doctor". The use of any records system relies on the doctor having the resources, time and motivation to maintain well organised and comprehensive records.

The practices who have participated in this project have benefited individually as well as substantially contributing to our knowledge of the implementation of this technology in medical practice.

The future holds several issues for the CAPP practices.

- The existing Medrecord system is unlikely to be further developed, leaving many practices in an uncertain position regarding their clinical records.
- The sites that have successfully implemented records hold an estimated 100 doctor/years of medical records data. If the CAPP practices upgrade or change systems then this data will need to be converted to the new computer system. The Medrecord sites are not alone with this problem as there are a few "superseded" medical records systems in use in Australia. While not many practices are affected at this stage, the issue of medical record data portability across computer systems deserves urgent consideration.

The issue of coding seems integral to the development of powerful medical records systems. The majority of CAPP doctors acknowledged this however shortcomings of the coding system hindered it's widespread use. Further development in this area is essential.

A preliminary attempt to aggregate the data from two CAPP practices suggests that the CAPP data could provide useful information about the management and costs of common problems in general practice.

The previous decade saw the development of affordable and reliable computer hardware. The Medrecord system was clearly the most sophisticated records software developed in the early 1980's yet few practices were prepared to purchase and implement computerised medical records. The computerisation of records, for all its potential and real advantages, was a task for the enthusiast. An issue that must be addressed is access to high quality, functional software. The question for the computer industry is how to develop this in a commercial market-place.

It seems clear that the records system of the future will need to be computerised to meet the doctor's professional obligations, the expectations of patients, and the information requirements of those who pay for our health system. In spite of this there are many barriers to the introduction of this technology in Australian general practice. The identification and removal of these barriers is certainly a task for the 1990's.

## Acknowledgments

The Royal Australian College of General Practitioners wishes to acknowledge the contributions of the participating practices, Medrecord Pty Ltd, Professor Neil Carson, Mr. Ross Davey and Dr. David Bennett.

The members of the CAPP evaluation team were: Dr. Peter MacIsaac, Miss Joan Caelli, Dr. Trevor Lord, Dr. Michael Crampton, Dr. Michael Kidd, Mr. Stephen Farish.

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